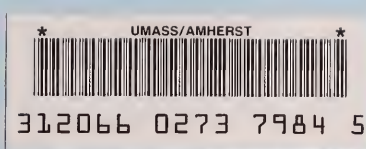


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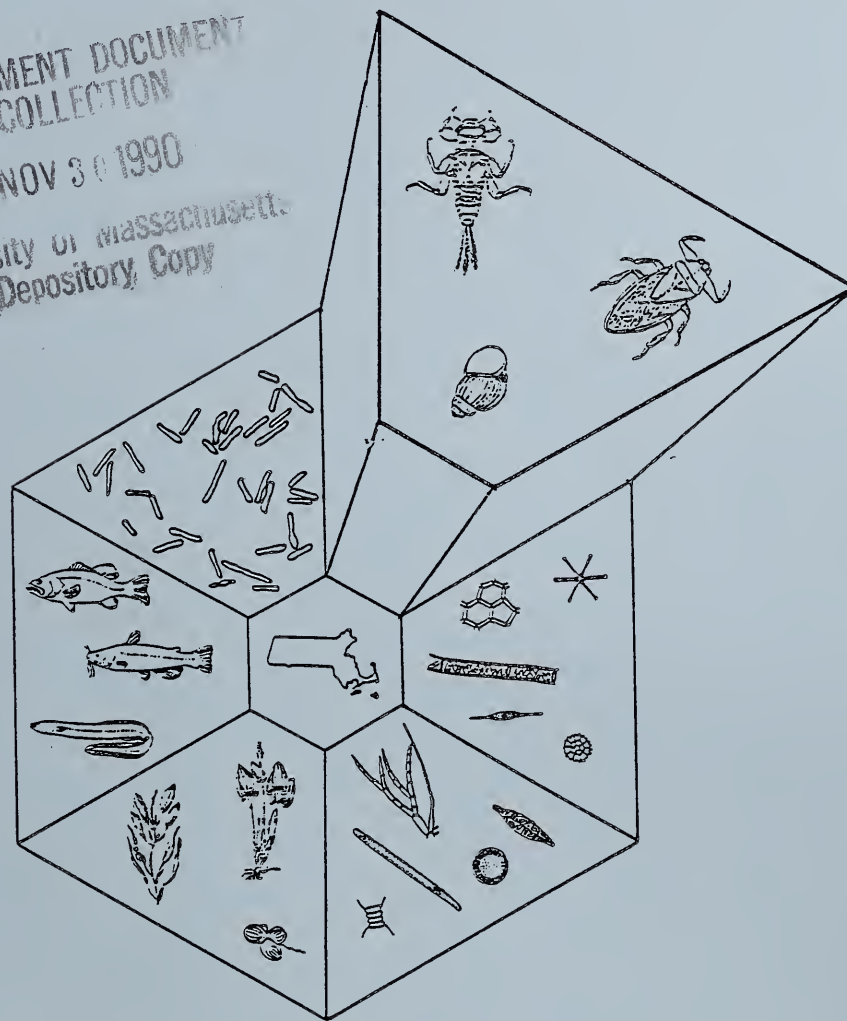


AQUATIC MACROINVERTEBRATE SURVEYS

PERFORMED BY THE

TECHNICAL SERVICES BRANCH

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BIOMONITORING PROGRAM 1973-1989

Massachusetts Department of Environmental Protection
Division of Water Pollution Control
Cornelius J. O'Leary, Acting Director

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BIOMONITORING PROGRAM

AQUATIC MACROINVERTEBRATE SURVEYS
PERFORMED BY THE TECHNICAL SERVICES BRANCH

1973 - 1989

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DECEMBER 1989


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the Technical Services Branch

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I. INTRODUCTION AND PROGRAM HISTORY

A list of aquatic macroinvertebrate surveys performed by the Technical Services Branch (formerly the Water Quality Section and, more recently, the Water Quality and Research Section) of the Massachusetts Division of Water Pollution Control (MDWPC) between 1973 and 1989 has been compiled and is herein presented. The list is arranged by drainage basin in accordance with the Massachusetts Stream Classification System. In addition to the survey year, information is provided with regard to the sampling and analytical method employed (i.e., qualitative, quantitative, or rapid bioassessment) and, where applicable, the MDWPC publication in which the survey results can be found. Finally, a bibliography is included of all of the MDWPC publications and technical memoranda that contain macroinvertebrate data and analyses.

A total of 47 ambient biomonitoring surveys performed in 22 river basins are listed. While the results of many of these studies are presented in published MDWPC reports, some appear in technical memoranda, and still others remain unpublished. Data from the latter are on file at the office of the Technical Services Branch in Westborough. Finally, two miscellaneous MDWPC publications and four unpublished reports are included in the bibliography which are not cited on the list. The published reports (see MR-D-1 and MS-Q-1) include information pertaining to freshwater macroinvertebrates in Massachusetts but are outside the realm of biomonitoring at specific waterbodies to assess water quality conditions. Publication MS-Q-1 utilized the state-wide macroinvertebrate data base as it existed in 1975 to draw inferences with respect to water quality and habitat preferences of twenty-five commonly occurring macroinvertebrate genera. In publication MR-D-1, the condition of the macroinvertebrate community downstream from four industrial sites was used as a measure of instream impacts to which effects predicted by effluent toxicity tests were compared. The four unpublished reports describe instances where macroinvertebrate sampling was utilized to assess impacts of specific industrial discharges or hazardous waste releases to surface waters.

MDWPC biologists have been sampling the freshwater macroinvertebrate community to supplement traditional physico-chemical water quality assessment techniques since 1973. The first ten years of invertebrate assessment were marked by the development and refinement of quantitative sampling techniques which allowed for the determination of macroinvertebrate standing crop and/or biomass, as well as for the calculation of diversity indices which integrate two components of community structure, richness and evenness, into a single value. Since 1983, the biomonitoring program has shifted away from quantitative macroinvertebrate surveys and toward "rapid bioassessments" designed to minimize laboratory time requirements for taxonomic identification and enumeration of organisms. Both quantitative and rapid assessment methodologies are described in detail in a Biomonitoring Program Standard Operating Procedures manual which was originally published in April, 1986 and is revised annually.

II. LIST OF AQUATIC MACROINVERTEBRATE SURVEYS

AQUATIC MACROINVERTEBRATE SURVEYS
PERFORMED BY THE TECHNICAL SERVICES BRANCH
1973 - 1989

BASIN/DRAINAGE	CODE ¹	DATE	METHOD	PUBLICATION CODE ²
Hoosic	11	1984	MRB	Unpublished
		1985	MRB	Unpublished
Housatonic	21	1974	Quantitative	21-C-2
		1978	Quantitative	Unpublished
Farmington	31	1974	Quantitative	31-CD-1
Westfield	32	1978	Quantitative	32-C-2
Deerfield	33	1988	MRB	Unpublished
Millers	35	1973	Quantitative	35-C-1
		1979	Qualitative	Unpublished
		1987	MRB	Unpublished
Chicopee (Ware River)	36	1989	MRB	Unpublished
Quinebaug	41	1974	Quantitative	41/42-C-1
		1976	Quantitative	Unpublished
French	42	1974	Quantitative	41/42-C-1
		1976	Quantitative	Unpublished
		1984	Quantitative	41/42-AB-4
Blackstone	51	1973	Quantitative	51-C-1
		1977	Quantitative	Unpublished
		1985	MRB	Unpublished
Ten Mile	52	1973	Quantitative	52-AB-2
		1984	MRB	52-C-3
Taunton (Rumford-Threemile) (Matfield-Town) (Nemasket-Assonet)	62	1975	Quantitative	Unpublished
		1975	Quantitative	Unpublished
		1988	MRB	Unpublished
		1975	Quantitative	Unpublished
		1983	MRB	62-C-2
		1989	MRB	Unpublished
		1975	Quantitative	Unpublished

BASIN/DRAINAGE	CODE ¹	DATE	METHOD	PUBLICATION CODE ²
Mystic	71	1979	Qualitative	Unpublished
Charles	72	1973	Quantitative	72-C-2
		1987&	MRB	Nuzzo memo (9/15/89)
		1988		
(Muddy River)		1974	Quantitative	72-C-2
Neponset	73	1977	Qualitative	MR-A-3
Nashua	81	1977	Quantitative	81-C-2
		1985	MRB	Unpublished
(Nissitissit River)		1973	Quantitative	Unpublished
Concord	82	1976	Qualitative	MR-A-4
(Sudbury River)		1986	MRB	Nuzzo memo (12/31/87)
(Assabet River)		1977	Qualitative	MR-A-3
		1986	MRB	Unpublished
Merrimack	84	1974	Quantitative	84-C-2
		1986	(Hester-Dendy)	Nuzzo memo (9/26/88)
(Black Brook, Stony Brook, Beaver Brook)		1976	Qualitative	MR-A-4
Parker	91	1984	Qualitative	91-AC-1
Ipswich	92	1977	Qualitative	MR-A-3
South Shore	94	1983	Qualitative	94-AB-4
(North River)				
Cape Cod	96	1983	Qualitative	96-C-1
(Herring River)				

¹ c.f. Massachusetts Stream Classification Program
Part I. Inventory of Rivers and Streams.
MDFW & MDWPC, July, 1982.

² see Bibliography

III. BIBLIOGRAPHY

Published Reports

- 21-C-2 Housatonic River Basin Water Quality Analysis. 1969 and 1974. 115 p. + appendices, 17 tables, 15 figs.
- 31-CD-1 Farmington River Basin Water Quality Analysis and Basin Plan. 1975. 68 p. + appendices, 14 tables, 13 figs.
- 32-C-2 Westfield River Basin Water Quality Analysis. 1978. 121 p., 21 tables, 27 figs.
- 35-C-1 Millers River Basin Water Quality Analysis. 1965 and 1973. 72 p., 10 tables, 25 figs.
- 41/42-C-1 French and Quinebaug River Basins Water Quality Analysis. 1972 and 1974. 119 p., 10 tables, 22 figs.
- 41/42-AB-4 French and Quinebaug River Basins Water Quality, Wastewater Discharge, and Biological Survey Data. 1984 and 1985. ix + 94 p., 62 tables, 3 figs.
- 51-C-1 Blackstone River Basin Water Quality Analysis. 1973. 118 p., 26 tables, 38 figs.
- 52-AB-2 Ten Mile River Basin Water Quality and Wastewater Discharge Survey Data. 1973. 90 p., 37 tables, 15 figs.
- 52-C-3 Ten Mile River Basin Biological Assessment of Water Pollution. 1984. viii + 83 p., 20 tables, 13 figs.
- 62-C-2 Matfield River Water Quality Analysis: Impacts of the Brockton Wastewater Treatment Plant. 1982 and 1983. 48 p., 9 tables, 10 figs.
- 72-C-2 Charles River Basin Water Quality Analysis. 1973 and 1976. 174 p., 27 tables, 57 figs.
- 81-C-2 Nashua River Basin Benthic Macroinvertebrate Water Quality Survey. 1977. 45 p., 3 tables, 7 figs.
- 84-C-2 Merrimack River Benthic Macroinvertebrate Analysis. 1974. 29 p., 3 tables, 9 figs.
- 91-AC-1 Parker River Basin Water Quality Survey Data and Deepwater Habitat Assessment. 1984. vi + 14 p. + appendices, 2 tables, 5 figs.
- 94-AB-4 North River Water Quality and Wastewater Discharge Survey Data. 1983. 129 p., 58 tables, 14 figs.

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- 96-C-1 Herring River Survey. 1983. 35 p., 10 tables, 2 figs.
- MR-A-3 Water Quality Monitoring Program of the Metropolitan Area Planning Council's 208 Management Area. 1977. 226 p., 163 tables, 14 figs.
- MR-A-4 Northern Middlesex Area Commission Areawide Wastewater Management Study: Water Quality Survey Data. 1976. 180 p., 52 tables, 1 fig.
- MR-D-1 A Comparison of Acute Toxicity Evaluations with Macroinvertebrate Community Analyses at Sites of Electrofinishing Discharges to Streams in Massachusetts. 1983. 78 p. + appendices, 12 tables, 6 figs.
- MS-Q-1 Environmental Preferences of Selected Freshwater Benthic Macroinvertebrates. 1978. 93 p., 9 tables, 5 figs.
- MS-S-1 Biomonitoring Program Standard Operating Procedures. 1986. iv + 100 p.
- MS-S-2 Biomonitoring Program Standard Operating Procedures. 1987. iv + 105 p.
- MS-S-3 Biomonitoring Program Standard Operating Procedures. 1988. iv + 114 p.
- MS-S-4 Biomonitoring Program Standard Operating Procedures. 1989. iv + 132 p.

Technical Memoranda

- Nuzzo, R.M. 1986 Sudbury River MRB. Technical Memorandum (BIO 86-14), 31 December 1987. 9 p.
- Nuzzo, R.M. 1986 Study of the Merrimack River Macroinvertebrates. Technical Memorandum 86-5, 26 September 1988. 19 p.
- Nuzzo, R.M. Benthos in Chicopee Brook (1989). Memorandum to Alan N. Cooperman, 18 May 1989. 6 p.
- Nuzzo, R.M. Assessment of Impacts of the Milford WWTP on the Upper Charles River (1987-1988). Technical Memorandum 87-7/88-5, 15 September 1989. 6 p.
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